APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/067,335	02/07/2002	Nobuhiro Kuwamura	H-1023	4607

			EXAMINER
24956	7590	07/22/2004	TORRES, JOSEPH D

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ART UNIT	PAPER NUMBER
2133	6

DATE MAILED: 07/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 February 2002*.

2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 February 2002* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1.   The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5)

because they include the following reference character(s) not mentioned in the

description: '206' in Figure 2; '408' in Figure 4; '510', '504', '506' & '507' in Figure 5;

'816' in Figure 8. Corrected drawing sheets, or amendment to the specification to add

the reference character(s) in the description, are required in reply to the Office action to

avoid abandonment of the application. Any amended replacement drawing sheet should

include all of the figures appearing on the immediate prior version of the sheet, even if

only one figure is being amended. The replacement sheet(s) should be labeled

"Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct

any portion of the drawing figures. If the changes are not accepted by the examiner, the

applicant will be notified and informed of any required corrective action in the next Office

action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2.   Claims 3-6, 9 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by

Weng; Lih-Jyh (US 5321703 A).

35 U.S.C. 102(b) rejection of claims 3-6, 9 and 10.

Weng teaches a storage device (col. 1, lines 10-15, Weng) comprising: a recording

medium (col. 1, lines 10-15, Weng); a head which reads data recorded on this recording

medium (col. 1, lines 10-15, Weng); a channel which reproduces digital data from the

read signal amplified by this amplifier (Processor 10 and Controller 11 in Figure 1 of

Weng comprise a channel for reproducing digital data from the read signal); a data

memory which stores a plurality of digital data read a plurality of times by said head and

reproduced by said channel (col. 2, lines 1-10 in Weng teach that copies of encoded

data are respectively read from a storage location on the storage device; the Abstract in

Weng teaches that the data from each trial is decoded and saved); a comparator which

compares the values of the same byte positions of said plurality of digital data extracted

from said memory (col. 2, lines 31 and Figure 2 in Weng teaches a comparator function

for comparing symbols in the same location of the repetitive copies of data for majority

logic reconstruction of the original data), and issues error pointers that ascertain the

error positions (The Abstract in Weng teaches that any of the symbols that is not

sufficiently reliable is marked as an erasure for use in an error-and-erasure correction

algorithm); a buffer memory which stores one or more digital data reproduced by said

channel (col. 5, lines 47-52 in Weng teach that the Controller 11 in Figure 1 has a

memory for storing read data); and a Reed Solomon error-and-erasure correction

decoder (col. 4, lines 6-20 in Weng teach that the Processor 10 and Controller 11 in

Figure 1 of Weng is a Reed Solomon error-and-erasure correction decoder).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3.   Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Weng; Lih-Jyh (US 5321703 A) in view of Armstrong; Alan J. et al. (US 5701314 A,

hereafter referred to as Armstrong).

35 U.S.C. 103(a) rejection of claims 7 and 8.

Weng substantially teaches the claimed invention described in claims 3-6 (as rejected

above).

However Weng does not explicitly teach the specific use of judging an error has

occurred in the data in positions where these values differ even one time.

The Examiner asserts that Weng teaches a threshold to determine whether each voted-

on symbol is sufficiently "reliable" (Abstract, Weng). Picking a specific value for the

threshold encompassed by the teachings in the Weng patent based on obvious

engineering design requirements such as desired error rate and throughput does not

deviate from the scope or the intent of the teachings in the Weng patent.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the

invention was made to modify the teachings of Weng by including use of judging an

error has occurred in the data in positions where these values differ even one time.

This modification would have been obvious to one of ordinary skill in the art, at the time

the invention was made, because one of ordinary skill in the art would have recognized

that use of judging an error has occurred in the data in positions where these values

differ even one time would have provided the opportunity to determine whether each

voted-on symbol is sufficiently "reliable" (Abstract, Weng) based on obvious engineering

design requirements such as desired error rate and throughput.

4.   Claims 1, 2, 11 and 12 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Weng; Lih-Jyh (US 5321703 A) in view of Armstrong; Alan J. et al.

(US 5701314 A, hereafter referred to as Armstrong).

35 U.S.C. 103(a) rejection of claim 1.

Weng teaches a storage device (col. 1, lines 10-15, Weng) comprising: a recording

medium (col. 1, lines 10-15, Weng); a head which reads data recorded on this recording

medium (col. 1, lines 10-15, Weng); a channel which reproduces digital data from the

read signal (Processor 10 and Controller 11 in Figure 1 of Weng comprise a channel for

reproducing digital data from the read signal); and a comparator which compares a

plurality of digital data values in the same byte position obtained from said head by a

plurality of readings (col. 2, lines 1-10 in Weng teach that copies of encoded data are

respectively read from a storage location on the storage device and col. 2, lines 31 and

Figure 2 in Weng teaches a comparator function for comparing symbols in the same

location of the repetitive copies of data for majority logic reconstruction of the original

data).

However Weng does not explicitly teach the specific use of an amplifier, which amplifies

the signal read by this head.

Armstrong, in an analogous art, teaches use of an amplifier, which amplifies the signal

read by this head (see Variable Gain Amplifier 22 in Figure 4 of Armstrong). Note:

Weng teaches a majority logic reconstruction method for use in a recording medium but

does not teach the specifics of the recording medium whereas Armstrong does, hence

one of ordinary skill in the art at the time the invention was made would have been

highly motivated to combine the teachings of the Weng and Armstrong patents in order

to enhance the error correction capabilities (col. 1, lines 67-68 in Weng).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the

invention was made to modify Weng with the teachings of Armstrong by implementing

the majority logic reconstruction method in a typical recording medium similar to the one

presented in the Armstrong patent. This modification would have been obvious to one

of ordinary skill in the art, at the time the invention was made, because one of ordinary

skill in the art would have recognized that implementing the majority logic reconstruction

method in a typical recording medium similar to the one presented in the Armstrong

patent would have provided the opportunity to enhance the error correction capabilities

(col. 1, lines 67-68 in Weng).

35 U.S.C. 103(a) rejection of claims 2, 11 and 12.

Weng teaches a storage device (col. 1, lines 10-15, Weng) comprising: a recording

medium (col. 1, lines 10-15, Weng); a head which reads data recorded on this recording

medium (col. 1, lines 10-15, Weng); a channel which reproduces digital data from the

read signal amplified by this amplifier (Processor 10 and Controller 11 in Figure 1 of

Weng comprise a channel for reproducing digital data from the read signal); a data

memory which stores a plurality of digital data read a plurality of times by said head and

reproduced by said channel (col. 2, lines 1-10 in Weng teach that copies of encoded

data are respectively read from a storage location on the storage device; the Abstract in

Weng teaches that the data from each trial is decoded and saved); a comparator which

compares the values of the same byte positions of said plurality of digital data extracted

from said memory (col. 2, lines 31 and Figure 2 in Weng teaches a comparator function

for comparing symbols in the same location of the repetitive copies of data for majority

logic reconstruction of the original data), and issues error pointers that ascertain the

error positions (The Abstract in Weng teaches that any of the symbols that is not

sufficiently reliable is marked as an erasure for use in an error-and-erasure correction

algorithm); a buffer memory which stores one or more digital data reproduced by said

channel (col. 5, lines 47-52 in Weng teach that the Controller 11 in Figure 1 has a

memory for storing read data); and a Reed Solomon error-and-erasure correction

decoder (col. 4, lines 6-20 in Weng teach that the Processor 10 and Controller 11 in

Figure 1 of Weng is a Reed Solomon error-and-erasure correction decoder).

However Weng does not explicitly teach the specific use of an amplifier, which amplifies

the signal read by this head or the specifics details of a Reed Solomon error-and-

erasure correction decoder.

Armstrong, in an analogous art, teaches use of an amplifier, which amplifies the signal

read by this head (see Variable Gain Amplifier 22 in Figure 4 of Armstrong) and a Reed

Solomon error-and-erasure correction decoder (see Syndrome Generator 200, Erasure

Location Value Generator 197, Decoder Circuit 199 in Figure 1 in Armstrong). Note:

Weng teaches a majority logic reconstruction method for use in a recording medium

using a Reed Solomon error-and-erasure correction algorithm but does not teach the

specifics of the recording medium whereas Armstrong does, hence one of ordinary skill

in the art at the time the invention was made would have been highly motivated to

combine the teachings of the Weng and Armstrong patents in order to enhance the

error correction capabilities (col. 1, lines 67-68 in Weng). Note also, Weng teaches a

syndrome generator which produces a syndrome from the digital data stored in said

buffer memory (Syndrome Generator 200 in Armstrong in Figure 1 of Armstrong); a

decoder which produces an erasure-locator polynomial from said erasure pointers (Erasure Location Value Generator 197 in Figure 1 of Armstrong; Note: an Erasure Location Value Generator substantially produces an erasure-locator polynomial from erasure values received on line 192), and which produces a modified error-locator polynomial and an error-magnitude polynomial from this erasure-locator polynomial and said syndrome (col. 11, lines 63-67 in Armstrong teach that Reed-Solomon Decoder 199 in Figure 1 of Armstrong receives error location values from Erasure Location Value Generator 197 and syndromes from Syndrome Generator 200; col. 9, lines 57-67 in Armstrong teach that Reed-Solomon Decoder 199 produces an error-locator polynomial; Root Search & Error/Erasure Magnitude Generator 196 in Figure 1 of Armstrong produces an error-magnitude polynomial); and an error position generator which calculates errors from said modified error-locator polynomial and said error-magnitude polynomial (Root Search & Error/Erasure Magnitude Generator 196 in Figure 1 of Armstrong is an n error position generator which calculates errors from said modified error-locator polynomial and said error-magnitude polynomial).
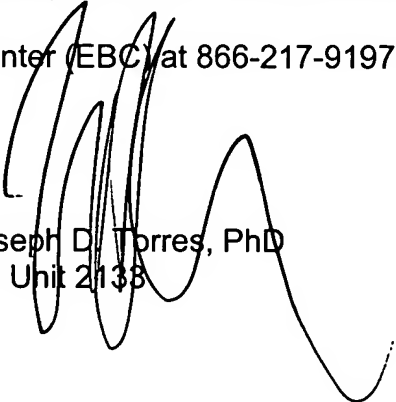
Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Weng with the teachings of Armstrong by implementing the majority logic reconstruction method in a typical recording medium similar to the one presented in the Armstrong patent. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that implementing the majority logic reconstruction method in a typical recording medium similar to the one presented in the Armstrong

patent would have provided the opportunity to enhance the error correction capabilities

(col. 1, lines 67-68 in Weng).

Conclusion

5.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Joseph D. Torres whose telephone number is (703)

308-7066. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Albert Decady can be reached on (703) 305-9595. The fax phone number

for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published

applications may be obtained from either Private PAIR or Public PAIR. Status

information for unpublished applications is available through Private PAIR only. For

more information about the PAIR system, see http://pair-direct.uspto.gov. Should you

have questions on access to the Private PAIR system, contact the Electronic Business

Center (EBC) at 866-217-9197 (toll-free).

Joseph D. Torres, PhD
Art Unit 2133